



# Best Practice

Evidence-based information sheets for health professionals

## Interventions to reduce the incidence of falls in older adult patients in acute care hospitals

### Recommendations

- Introduction of multidisciplinary multifactorial intervention program including a falls risk alert card, an exercise program, an education program and the use of hip protectors after approximately 45 days is recommended to reduce falls in acute hospitals. **(Grade A)**
- Use of one-on-one patient education package entailing information on risk factors and preventative strategies for falls as well as goal setting is recommended. **(Grade A)**
- Introduction of a targeted falls risk factor reduction intervention that includes a falls risk factor screen, recommended interventions encompassing local advice and a summary of the evidence is recommended. **(Grade A)**
- A multidisciplinary multifactorial intervention that consists of systematic assessment and treatment of fall risk factors, as well as active management of postoperative complications can reduce the amount of falls in patients with femoral neck fracture following surgery. **(Grade A)**
- A falls prevention exercise program as a standalone intervention which comprises tai chi, functional movements and activity visualisation. **(Grade C)**
- Short-term (approximately 30 days) vitamin D and calcium supplementation. **(Grade C)**

### Information Source

This Best Practice information sheet has been derived from a systematic review published in 2009<sup>1</sup> which was based on 7 randomised controlled trials. The primary studies on which this information sheet is based are available from the Joanna Briggs Institute in the form of a Technical Report which can be viewed at [www.joannabriggs.edu.au](http://www.joannabriggs.edu.au)

The systematic review was report is available from the Joanna Briggs Institute [www.joannabriggs.edu.au](http://www.joannabriggs.edu.au)

### Background

It has been estimated that one third of people aged over 65 years, and half of people over 80 years, suffer at least one fall per year. Falls can have a considerable impact on the well-being of older adult patients; they can result in serious physical and emotional injury, poor quality of life and increased length of hospital stay.

Falls are attributed to many factors including trauma, debilitating disease, environmental hazards, age, mental status, length of hospital stay and gender. Many interventions for the prevention of falls within the acute setting have been recommended from the literature such as environmental modification, reviewing medication, providing safer footwear for patients, encouraging regular exercise and others.

While there has been a large number of studies conducted and many papers published, patient falls continue to be a major problem for hospitals.

### Grades of Recommendation

These Grades of Recommendation have been based on the JBI-developed 2006 *Grades of Effectiveness*<sup>1</sup>

**Grade A** Strong support that merits application

**Grade B** Moderate support that warrants consideration of application

**Grade C** Not supported

## Definitions

For the purposes of this information sheet the following definitions are used:

**Falls:** The older adult patient unintentionally coming to rest on the ground or other lower level, other than as a consequence of sustaining violence or an epileptic seizure

## Objectives

The purpose of this Best Practice Information Sheet is to present the best available evidence for the effectiveness of interventions designed to reduce the incidence of falls in older adult patients in acute care hospitals.

## Types of Intervention

The interventions of interest include those designed to assess the risk of falling or those used to minimise the risk of falling in older adult hospital patients. These interventions are compared with either standard practice, which includes any method or technique already in place at the facility, or no intervention.

## Quality of the research

The systematic review includes 7 randomised controlled trials of moderate methodological quality. Only one was double blinded while the sample size varied from 173 to 3999.

## Findings

### Vitamin D

No strong evidence was found to support the use of vitamin D in reducing falls in acute hospitals. A double-blinded RCT was conducted to determine whether routine supplementation of vitamin D and calcium decreased the number of falls in an acute care setting. Two hundred and five older adult patients over 65 years who were newly admitted or transferred to a general assessment and rehabilitation ward of an acute geriatric medical unit, were included in the study. The intervention group received daily vitamin D 800 iu (international units) and calcium 1200 mg while the control group received daily calcium 1200 mg. The supplements were administered to participants until either discharge from the hospital (median length of hospital stay was 30 days) or death.

The number of fallers was lower in the intervention group compared to the control group (36 versus 45) however it was not statistically significant (RR 0.82, 95% CI: 0.59 to 1.16). No significant difference was shown in the number of falls either (mean number of falls per person 1.040 for interventions versus 1.155 for controls).

## Patient Education

Strong evidence was found to encourage the use of a patient education package in reducing the incidence of falls in older adult patients. In a study involving 226 patients who were recruited from consecutive admissions to subacute hospital wards, the intervention group received the educational package while the control group did not receive it. The education package focussed on falls in the subacute setting, entailing one-on-one sessions that promoted discussion between a research OT (occupational therapist) (i.e. not a hospital staff member and not directly involved in patient care) and the patient. The length of each session was not standardised, and varied between 15 minutes to 35 minutes; this decision was left up to the OT. Sessions were performed twice a week at the bedside. Participants in the intervention group received a median of four sessions.

A significant reduction in the incidence of falls was shown in the intervention group compared with the control group (log-rank test  $p = 0.007$ ). Post-hoc analyses revealed a stronger reduction in falls in people with lower Mini Mental State Examination scores compared with those with higher scores. This result was statistically significant ( $p = 0.03$ ) for those with MMSE score less than or equal to 23. However, results were not significant for people without cognitive impairment.



## Exercise

No strong evidence was found to support a falls prevention exercise program as a standalone intervention. One component of the larger multifaceted RCT project examined the effectiveness of an exercise program which comprises tai chi, functional movements and activity visualisation. The intervention group (n=93) received three 45 minute exercise sessions delivered weekly to a group of up to four patients. Exercises were made up of a combination of tai chi mixed with functional movements and activity visualisation. The control group (n=80) received usual care which included 24 hour nursing care, a falls risk screen, regular medical review, physiotherapy, OT sessions, podiatry, dietetics, social work and speech pathology. Physiotherapy and OT sessions were for one hour each and delivered five times per week. Intervention group members also received usual care.

A significant reduction in the incidence of falls was seen in those undergoing the exercise program compared with controls (p= 0.007). However, when the researchers analysed the data for participants who only participated in the exercise intervention (and not any of the other three possible interventions from the larger trial), the difference in fall rates was non-significant.

## Target Risk Factor Reduction

Use of target risk factor education was shown to be effective in reducing falls. A ward randomised trial design was conducted involving 8 elderly care wards with matched 8 community units of a district general hospital. The intervention included a care plan with a short falls risk factor screen, subsequent interventions that included local opinion and a summary of the evidence. Interventions were applied by nurses to those patients who were recognised as at risk of falling. This group consisted of patients who had a history of falling, patients who had previously fallen and those who had a 'near-miss' following hospital admission. Interventions listed on the care plan were multidisciplinary and included aspects such as footwear safety, bed height and medication. Control wards did not undergo any changes to their practice. The duration of the project was for one year and the four intervention wards received the intervention for the last six months of the study.

A statistically significant decline in recorded number of falls was found in the intervention group compared (RR = 0.79, 95% CI, 0.65 to 0.95) while a non-significant result was shown for controls (RR = 1.12, 95%CI, 0.96 to 1.31). Additionally the incidence of fall-related injuries was non-significant across both groups. The authors concluded that the introduction of a care plan that targets risk factor reduction in older inpatients was effective in reducing the risk of recorded falls.

## Targeted Multifactorial Interventions

Three RCTs evaluated multi-dimensional intervention packages with various types of components.

A first trial did not find significant benefit of using multifactorial intervention including risk assessment, education of patients and staff, medication review, modification of environment, exercise and alarms. Twenty-four elderly care wards from 12 hospitals in Australia (12 acute and 12 rehabilitation wards) were matched with another ward prior to randomisation. Ward pairs partook in the study consecutively over a period of 36 months. Each ward was studied for 3 months. The total number of participants on designated wards was close to 4000. Interventions were delivered by a nurse and a physiotherapist. Alarms were custom designed and were only for participants that staff considered to be unsafe in walking unsupported and who were likely to do so. Control wards underwent usual care which was not defined.

No significant difference was found between the number of falls in intervention and control groups after the intervention was introduced. A mean fall rate of 9.26 per 1000 bed days was calculated for the intervention wards compared with 9.20 per 1000 bed days for the control wards (p=0.96).

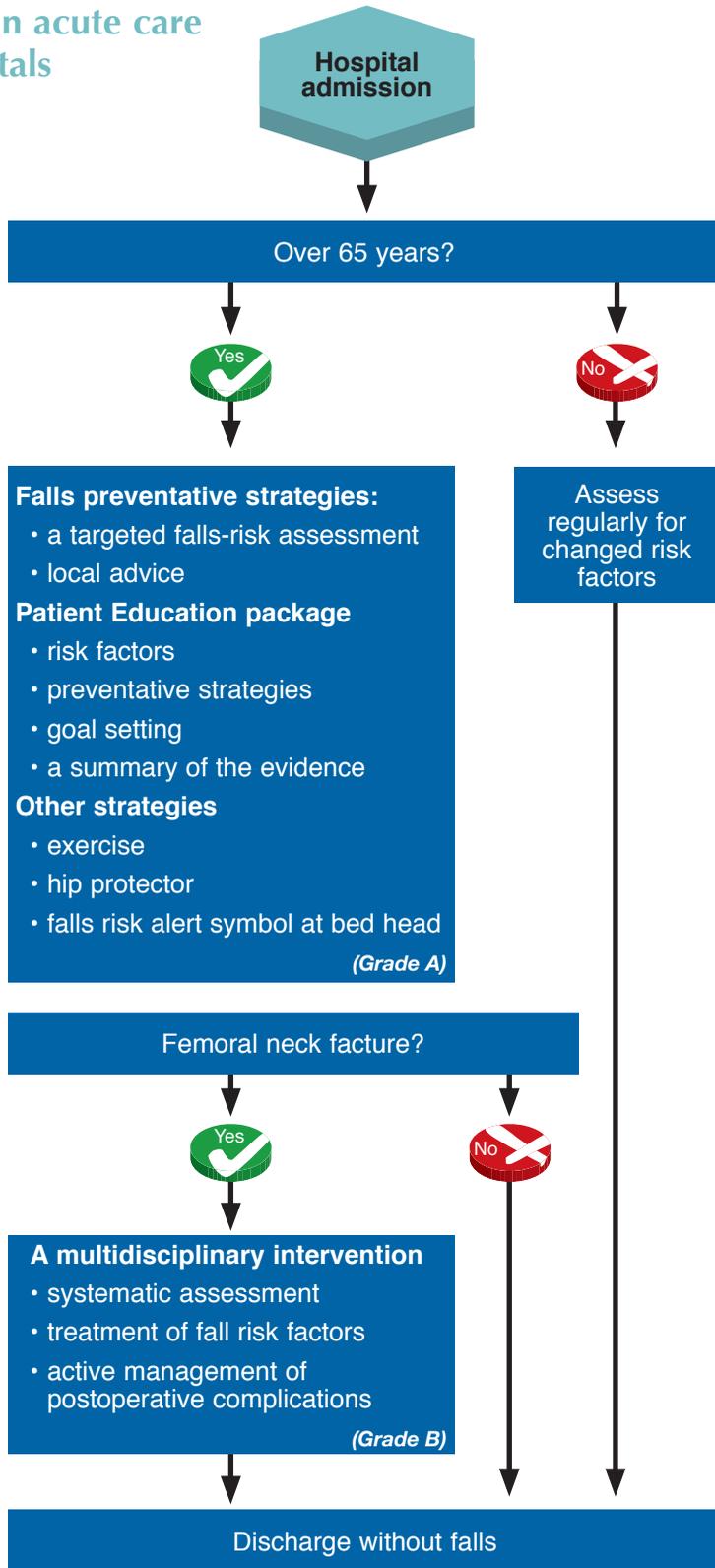
The second RCT reported significant benefit of using a postoperative multidisciplinary multifactorial program with comprehensive geriatric assessments, management of fall risk factors, rehabilitation, and active prevention, detection and treatment of postoperative complications in reducing falls in a group of patients following femoral neck fracture. The study included 199 patients who were over 70 years of age and admitted consecutively to the orthopaedic department. The control group received conventional postoperative care practices.

Results revealed that the fall incidence was significantly lower in the intervention group compared with controls (Incidence Rate Ratio [IRR] 0.38, 95% CI, 0.20 to 0.76). The intervention group also showed significantly less falls among people with dementia (IRR 0.07, 95% CI 0.01 to 0.57) as well as a significantly shorter hospital stay (28.0 – 17.9 days compared with 38.0 – 40.6 days, p = 0.028).

A third study showed a significant benefit of using multiple intervention falls prevention program including a risk alert card, an information brochure, an exercise program, an education program and utilisation of hip protectors. A total of 626 people from 3 subacute wards were included with the mean age of 80 years (SD = 9). Controls received usual care including weekly medical assessment, one hour sessions of physiotherapy and occupational therapy (one hour each weekday), 24 hour nursing assistance and other additional services (not defined) when needed.

A statistically significant reduction in the number of falls was reported in the intervention group compared with controls (Peto log rank test p = 0.045). This result was most prominent after 45 days of observation. A significant reduction in the proportion of people who experienced a fall was also shown (RR =0.78, 95% CI, 0.56 to 1.06) and fall-related injuries were shown to be 28% lower in the intervention group. The authors concluded that implementation of this targeted multifactorial falls prevention program was effective in reducing the incidence of falls.

# Falls in acute care hospitals



## Acknowledgments

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## References

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**THE JOANNA BRIGGS INSTITUTE**

The Joanna Briggs Institute  
The University of Adelaide  
South Australia 5005  
AUSTRALIA  
[www.joannabriggs.edu.au](http://www.joannabriggs.edu.au)  
© The Joanna Briggs Institute 2011  
ph: +61 8 8303 4880  
fax: +61 8 8303 4881  
email: [jbi@adelaide.edu.au](mailto:jbi@adelaide.edu.au)



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This *Best Practice* information sheet presents the best available evidence on this topic. Implications for practice are made with an expectation that health professionals will utilise this evidence with consideration of their context, their client's preference and their clinical judgement.<sup>3</sup>